

Catalogue of American Amphibians and Reptiles.

Powell, R., J.T. Collins, and L.D. Fish. 1992. *Virginia valeriae*.

***Virginia valeriae* Baird and Girard**
Smooth Earth Snake

Virginia valeriae Baird and Girard, 1853:127. Type-locality, "Kent County, Maryland." Type-specimen, National Museum of Natural History (USNM) 1962, an adult (sex unknown) collected by Valeria Blaney (date of collection unknown) (not examined by authors).

Carpophis Harperti: Duméril, Bibron, and Duméril, 1854:135. Type-locality, "Il nous a été envoyé de Savannah (Caroline du Sud)." Type-specimen, unknown, apparently an adult (sex unknown)

collected by M. Harpert (date of collection unknown) (not examined by authors).

Coluta (Celuta) harperti: Lichtenstein and von Martens, 1856:23.

Virginia harperti: Cope, 1875:35.

Carpophis Harpetii: Bocourt, 1883:542.

Virginia valeriae Var. *harperti*: Garman, 1883:166.

• **Content.** Three subspecies are recognized: *valeriae*, *elegans*, *pulchra*, but see Comment.

• **Definition.** *Virginia valeriae* is a small (TL to 393 mm) colubrid snake characterized by a cone-shaped head, 19-20 maxillary teeth, 15-17 rows of mostly smooth body scales (some scales near the vent may be weakly keeled), and a divided anal scute. In males ventrals number 109-126, subcaudals 29-45, and tail length is 12-22%

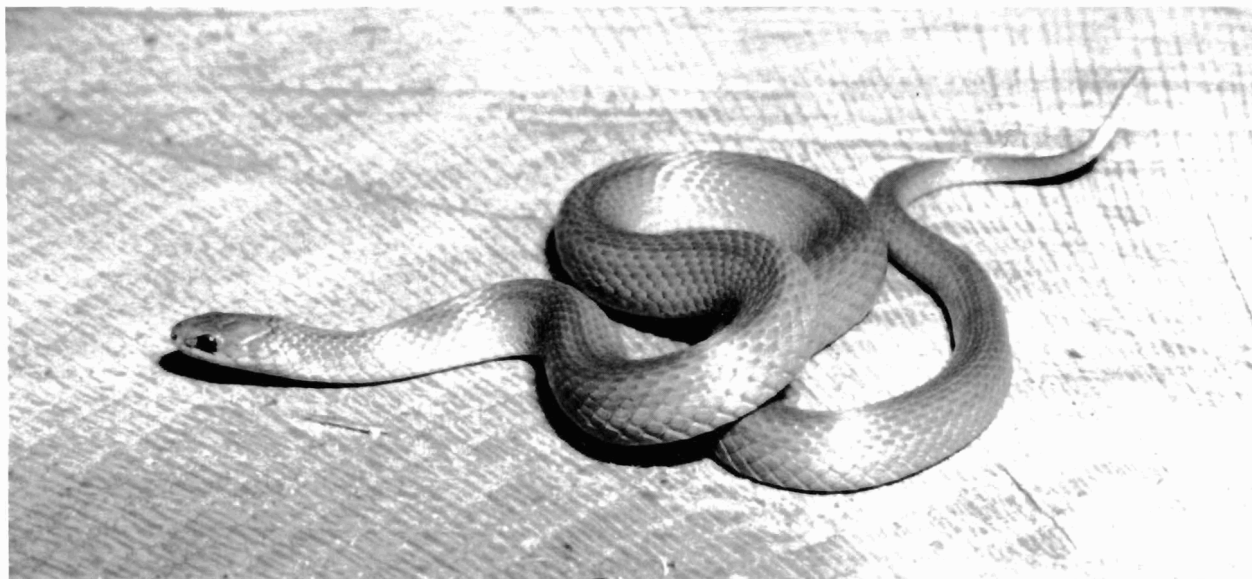
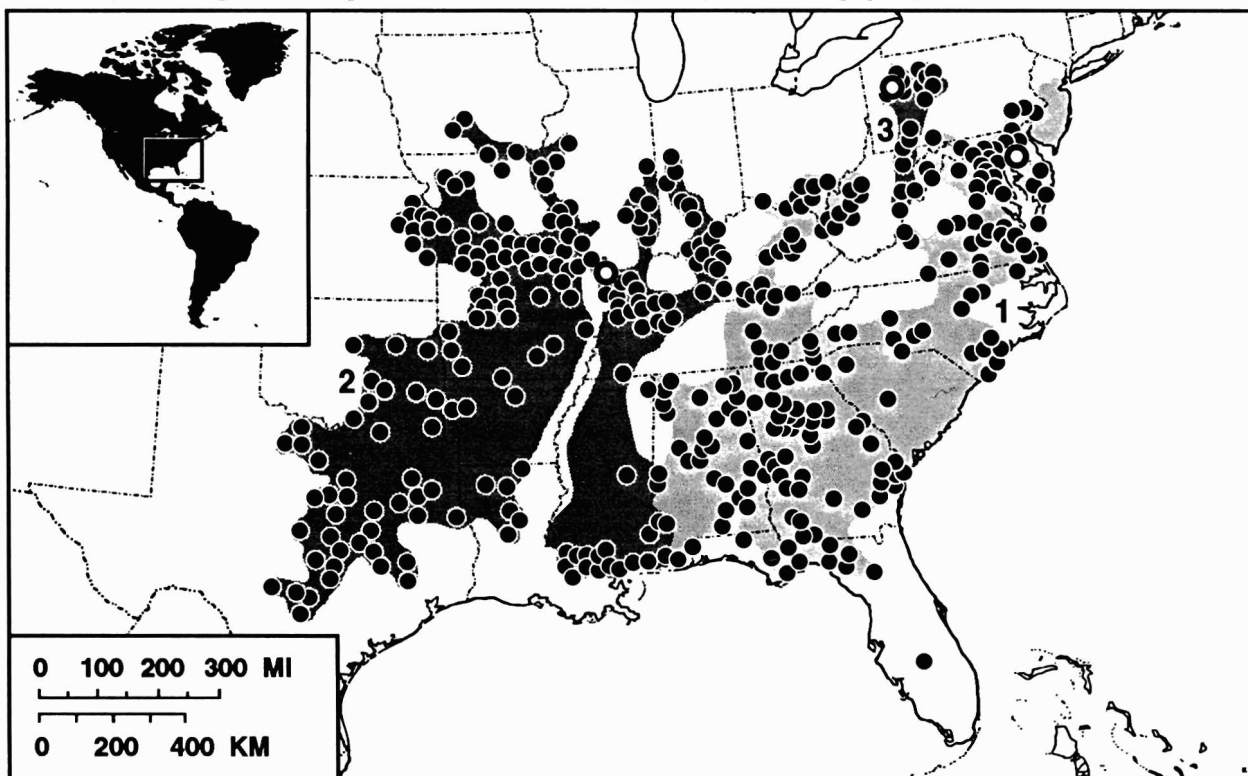


Figure 1. *Virginia valeriae pulchra* from Cameron County, Pennsylvania. Photograph by S.L. Collins and J.T. Collins.



Map. Range of *Virginia valeriae*. Large open circles indicate type-localities, solid circles mark other records.

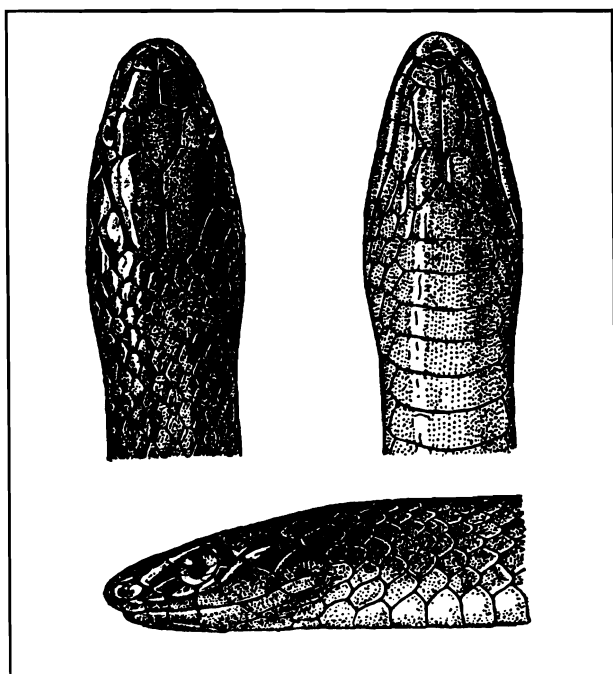


Figure 2. *Virginia valeriae elegans* (from Schmidt and Davis, 1941).

of total length; in females comparable figures are 112-134, 22-36, and 12-24%. Head scalation is as follows: 2 nasals, 1 loreal, no preoculars, usually 2 (1-3) postoculars, 1+1 temporals, 6 supralabials (the 3rd and 4th enter the orbit), and 6 infralabials.

Dorsal ground color varies from gray and greenish gray to reddish brown. A light middorsal stripe may be present, as may up to 4 longitudinal rows of small black dots. The plain venter is cream to light gray. Labial scales may bear some dark mottling.

The *in situ* hemipenis is approximately 6 subcaudals in length and is slightly bilobed and subcylindrical. The sulcus spermaticus is simple and terminates distally between the lobes. Proximal spines are set in fleshy lobes, are laterally compressed, sharply pointed, and recurved. Proceeding distally, after two large subequal basal spines, spines increase in size to a point ca. 20-25% of the length of the hemipenis, then decrease until reaching their minimum size in the most constricted area at about 50% the length of the organ. Distally the spines lose the fleshy lobe and are peg-like, straighter, and with smoothly rounded ends. They also decrease in number and become progressively larger toward the apex. The central depression is devoid of spines. The average level of origin of the retractor penis magnus is the 26th subcaudal; the retractor penis parvus originates at an average level of the 6th subcaudal.

• **Diagnosis.** *Virginia valeriae* can be distinguished from its congener, *V. striatula*, by the presence of 6 upper labials, usually 2 internasals and 2 postoculars, and smooth or at most weakly keeled dorsal scales, the latter often limited to the area near the vent.

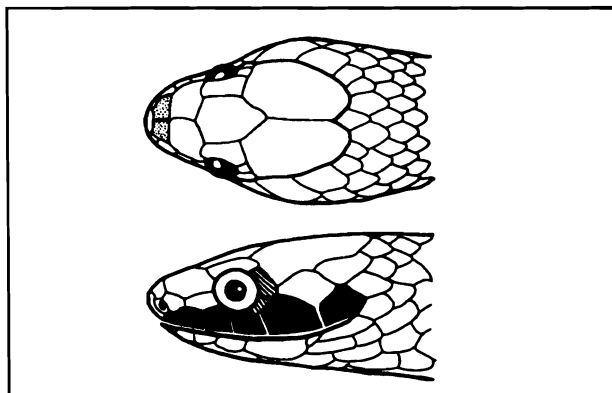


Figure 3. *Virginia valeriae elegans* showing diagnostic features (from Collins, 1982).

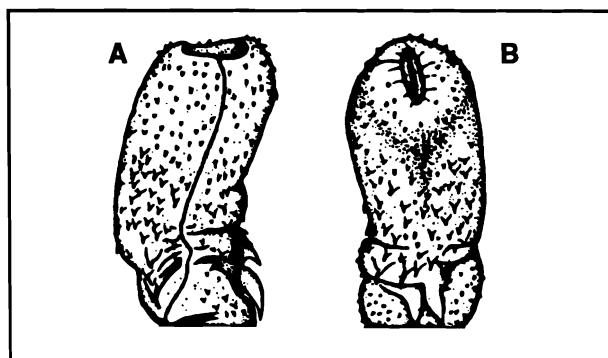


Figure 4. Median (A) and posterior (B) surfaces of the left hemipenis of *Virginia v. valeriae* (from Clark, 1964).

• **Descriptions.** In addition to the original descriptions cited in the synonymy and those in many regional and field guides, descriptions may be found in Duméril et al. (1870-1909), Boulenger (1894), Cope (1891, 1895, 1900), Ditmars (1907, 1936, 1939), Blanchard (1923), Wright and Wright (1957), Pisani and Collins (1971), Ernst and Barbour (1989), and Rossman and Wallach (1991). The hyoid apparatus was described by Langebartel (1968), vertebral morphology by Holman (1962, as *Haldea* sp.), cranial myology by Varkey (1979), size and position of visceral organs by Rossman et al. (1982), maxilla and maxillary teeth by Rossman and Myer (1990), hemipenes by Cope (1900) and Clark (1964), and microdermatoglyphic scale patterns by Price (1981) and Price and Kelly (1989).

• **Illustrations.** Line drawings are in Garman (1883), Cope (1895, 1900), Blanchard (1923, 1925), Haltom (1931), Pope (1937), Schmidt and Davis (1941), Smith (1961), Webb (1970), Linzey and Clifford (1981), Smith and Brodie (1982), Collins (1982), Tennant (1984, 1985), and Conant and Collins (1991). Colored illustrations are in Smith and Brodie (1982), Dundee and Rossman (1989), Conant and Collins (1991), and Conant et al. (1992). Black and white photographs are in Haltom (1931), Ditmars (1907, 1936, 1939), McCauley (1945), Conant (1951), Parmalee (1955), Smith (1956), Wright and Wright (1957), Cooper (1958), Smith (1961), Anderson (1965), Huheey and Stupka (1967), Collins and McDuffie (1972), Minton (1972), Mount (1975), Collins (1974, 1982), Vermersch and Kuntz (1986), and Ernst and Barbour (1989). Color photographs are in Barbour (1971), Snyder (1972), Behler and King (1979), Linzey (1979), Martof et al. (1980), Ashton and Ashton (1981), Linzey and Clifford (1981), Jackson (1983), Tennant (1984, 1985), Green and Pauley (1987), Johnson (1987), Obst et al. (1988), Ernst and Barbour (1989), Scott (1989), Sievert and Sievert (1989), Christiansen and Bailey (1990), Carmichael and Williams (1991), and Allen (1992). Line drawings of the hemipenis are in Cope (1895, 1900), Clark (1964), and Dowling and Duellman (1978); the latter also figured a maxilla and a partial trunk vertebra as an anchor for the muscles. Varkey (1979) included a line drawing of a dorsal view of the skull and vertebrae. Bradford (1973) provided photographs of microscopic sections of the reproductive tract.

• **Distribution.** The species ranges from New Jersey and Pennsylvania south to northern Florida and west to southern Iowa, northeastern Kansas, eastern Oklahoma, and central Texas. The range is illustrated in Blanchard (1923), Wright and Wright (1957), Behler and King (1979), Smith and Brodie (1982), Ballinger and Lynch (1983), Ernst and Barbour (1989), and Conant and Collins (1991).

Notes and regional guides for various states or geographic areas include: Alabama, Haltom (1931), Mount (1975); Atlantic Coast Barrier Islands, Gibbons and Coker (1978); Carolinas and Virginia, Martof et al. (1980); Florida, Carr (1940), Carr and Goin (1955), Ashton and Ashton (1981), Haast and Anderson (1981), Carmichael and Williams (1991); Georgia, Neill (1950), Williamson and Moulis (1979); Great Smoky Mountains National Park, Huheey and Stupka (1967); Illinois, Parmalee (1955), Rossman (1960), Smith (1961, 1968), Klimstra and Hutchison (1965), Merczak (1966), Thompson (1972), Dyrkacz (1973), Blanchard and Princen (1976), Hutchison (1976), Morris (1976), Applegate and Zimbleman (1978), Phillips (1991), Thurow and Sliwinski (1991); Indiana, Hay (1892), Minton (1944, 1972); Iowa, Christiansen and Bailey (1990); Kansas, Smith (1951, 1956), Collins (1974, 1982); Kentucky, Collins (1962), Barbour (1971), Pisani and Collins (1971), Meade (1991); Louisiana, Clark (1949), Dundee and

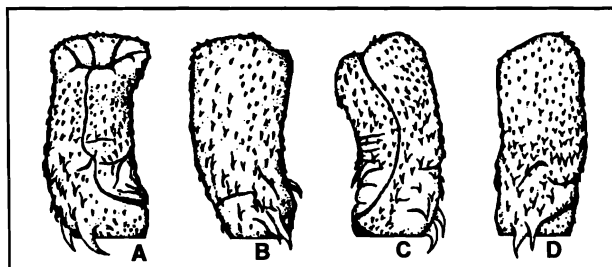


Figure 5. Median (A) and posterior (B) surfaces of the right hemipenis of *Virginia valeriae elegans*; median (C) and posterior (D) surfaces of the left hemipenis of *V. v. pulchra* (C) (from Clark, 1964).

Rossman (1989); Maryland and the District of Columbia, McCauley (1945), Cooper (1958), Harris (1975); Mississippi, Cook (1954), Smith and List (1955); Missouri, Hurter (1893, 1911), Anderson (1965), Johnson (1987), Powell et al. (1990, 1991), Powell (1992); Ohio, Conant (1951), Moody (1987); Oklahoma, Force (1930), Webb (1970), Carpenter and Krupa (1989), Sievert and Sievert (1989); Pennsylvania, Surface (1906), Conant (1936), Swanson (1952), McCoy (1982), Allen (1992), Hulse and Hulse (1992); South Carolina, Gibbons et al. (1976b), Gibbons (1978), Gibbons and Semlitsch (1991); Tennessee, Snyder (1972), Redmond et al. (1990); Texas, Strecker (1908, 1915), Davenport (1943), Gloyd (1944), Blair (1950), Brown (1950), Raun (1965), Rakowitz et al. (1983), Tennant (1984, 1985), McAllister and Ward (1986), Vermersch and Kuntz (1986), Dixon (1987); Virginia, Linzey and Clifford (1981), Tobey (1985); West Virginia, Green and Pauley (1987); Wisconsin (Vogt, 1981). Collins (1991b) suggested that the Mississippi River and/or its floodplain acts as a distributional barrier.

• **Fossil Record.** None for this species.

• **Pertinent Literature.** In addition to the general and regional works cited above and those in the synonymies, the following topics have been addressed: behavior (Davenport, 1943; Keeler, 1959; Yeatman, 1983), captive breeding (Rossi and Rossi, 1992), color (Myers, 1963), conservation (Anonymous, 1973, 1987; Gibbons et al., 1976a; Roosa, 1977; Collins et al., 1981; Allen, 1987; Busby, 1988; Simmons, 1989), ecology (Strecker, 1927; Allen, 1932; Stickel and Cope, 1947; Neill, 1948; Grizzell, 1949; Fitch, 1956; Hamilton and Pollack, 1956; Brode and Allison, 1958; Cliburn, 1958; Cooper, 1958; Pisani and Collins, 1971; Bradford, 1973; Brown, 1979; Gibbons and Semlitsch, 1981, 1987; Cervone, 1983), karyotype ($2n = 36$) (Hardy, 1971), longevity (Snider and Bowler, 1992), predation (Schmidt, 1932; Greene, 1984), reproduction (Sinclair, 1951; Cook, 1954; Martof, 1955; Keeler, 1959; Groves, 1961; Walker, 1963; Bothner and Moore, 1964; Fitch, 1970, 1985; Pisani, 1971; Pisani and Collins, 1971; Bradford, 1973; Blem and Blem, 1985; Morris and Walsh, 1991), sexual dimorphism (Clark, 1966; Pisani and Collins, 1971), and size (Cook, 1954; Laposha and Powell, 1982; Powell et al., 1982; Collins, 1990b). The species is listed in other checklists, guides, or keys by Yarrow (1882), Brown (1901), Stejneger and Barbour (1917-1943), Wright and Wright (1952), Schmidt (1953), Cagle (1968), Cochran and Goin (1970), Leviton (1971), Banks et al. (1987), Collins (1990a), Rossman and Wallach (1991), and Conant et al. (1992).

• **Etymology.** The name *valeriae* is a patronym honoring Valeria Blaney, who collected the holotype, *elegans* is from the Latin (fine or elegant), and *pulchra* is from the Latin *pulcher* (beautiful).

• **Remark.** Duméril et al. (1854) used the common name "Carphophis de Harpert," followed immediately by "*Carphophis Harperti*. Nobis." Subsequent synonymies have all used "*Carphophis*" without acknowledging the obvious error perpetrated by the typesetter.

1. *Virginia valeriae valeriae* Baird and Girard Eastern Earth Snake

Virginia valeriae Baird and Girard, 1853:127. See species synonymy. *Carphophis harperti*: Duméril, Bibron, and Duméril, 1854:135. See species synonymy. *Celuta (Celuta) harperti*: Lichtenstein and von Martens, 1856:23.

Virginia harperti: Cope, 1875:35.

Carphophis Harperti: Bocourt, 1883:542.

Virginia valeriae Var. *harperti*: Garman 1883:166.

Virginia valeriae valeriae: Blanchard, 1923:350. First use of combination.

• **Diagnosis.** This subspecies is characterized by mostly smooth dorsal scales in 15 rows; only near the vent are faint keels present. Dorsal color is gray to light brown.

2. *Virginia valeriae elegans* Kennicott Western Earth Snake

Virginia elegans Kennicott, 1859:99. Type-locality, "heavily timbered regions of southern Illinois" (Union Co. per Pisani, 1972). Holotype not designated, presumed to be lost by Blanchard (1923), given as Chicago Academy of Sciences (CA) 126 by Pisani (1972), an adult male collected by "Kennicott" (Kennicott, 1859, gave collectors as H. McVean and J.W. Waugh), date of collection unknown (not examined by authors).

Virginia valeriae: Cope, 1875:35. Part.

Haldea striatula: Cope, 1877:64. Part.

Virginia harperti elegans: Bocourt In Duméril, Bocourt, and Mocquard, 1886:32.

Virginia valeriae elegans: Blanchard 1923:351. First use of combination.

Potamophis striatulus: Van Cleave, 1928:133. Part.

Haldea valeriae elegans: Stejneger and Barbour, 1933:119.

Haldea valeriae: Murrill, 1945:23.

Haldea valeriae valeriae: Wright and Wright, 1952:586.

• **Diagnosis.** This subspecies is characterized by weakly keeled dorsal scales in 17 rows. Dorsal color is greenish gray to reddish brown.

3. *Virginia valeriae pulchra* (Richmond) Mountain Earth Snake

Haldea valeriae pulchra Richmond, 1954:251. Type-locality, "four miles north of Van, Venango Co., Pa." Type-specimen, Carnegie Museum (CM) 32205, an adult female collected by N. Richmond on 10 August 1953 (not examined by authors).

Virginia valeriae pulchra: Clark, 1964:33. First use of combination.

Virginia pulchra: Collins, 1991a.

• **Diagnosis.** This subspecies is characterized by weakly keeled dorsal scales in 15 rows anteriorly, but with 17 rows at midbody and posteriorly. Dorsal color is dark gray to a rich reddish brown.

• **Comment.** Whereas *V. v. pulchra* is allopatric with the other subspecies, is morphologically distinct, and no evidence of gene exchange exists, this subspecies may represent a separate species (Collins, 1991a); nor has intergradation between *V. v. valeriae* and *V. v. elegans* been established with certainty.

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